July 6, 2016

Mr. Rick Angrisani
Oakhurst Geologic Hazard Abatement District
6000 Heritage Trail
Clayton, CA 94517

Re: Summary of Geotechnical Monitoring and Inspection Services on June 30, 2016
Inclinometers/Piezometers/Wells at Kelok Way, Clayton, California
SFB Project No: 555-2

Mr. Angrisani:

In accordance with the Oakhurst Geologic Hazards Abatement District's authorization on June 22, 2016, Stevens, Ferrone & Bailey Engineering Company, Inc. (SFB) performed the monitoring of the selected inclinometer casings, vibrating wire and open pipe piezometers, and dewatering wells and outlet pipes located within Kelok Way and within the north facing slope located immediately to the north and below Kelok Way. This service was performed in accordance with the scope of work outlined in our proposal dated January 22, 2013. The approximate locations of these monitoring points are shown on the attached location map, Figure 1. This report summarizes the results of the monitoring, measurements, and inspections performed by SFB at the site on June 30, 2016. The results of our previous monitoring were presented in our previous reports dated 7/9/14, 1/13/15, and 8/11/15.

1.0 MONITORING, MEASUREMENT & OBSERVATION

1.1 Inclinometer Casings

SFB performed monitoring of the inclinometer casings located at BGC SI-1, CEG SI-1, CSA SI-1, CSA SI-2, CSA SI-3, W SI-1, and W SI-5 (7 locations) using a Slope Indicator Digitilt probe. The monitoring of casing at CSA SI-4 was not completed due to passage obstruction caused by excessive casing deformation at a depth of about 52 feet below the ground surface as first reported on June 19, 2014 by SFB. The profile views of the inclinometer casing measurement results (comparing to initial readings on 6/19/14 and 6/20/14) in both the 'A' (downhill) and 'B' (perpendicular to 'A') direction are presented in Appendix A. Both cumulative (profile change)

and incremental (tilt change) horizontal displacements are shown for each monitored inclinometer.

1.2 Vibrating Wire and Open Pipe Piezometers

The measurement of water pressures at vibrating wire piezometer locations was performed using a Slope Indicator VW DataRecorder. Vibrating wire piezometers allow for the measurement of water pressure at a specific location. Free groundwater levels at open pipe piezometers were measured with a Solinst water level meter. Open pipe piezometers measure the cumulative water pressure along the entire depth of the pipe.

The results of these measurements are tabulated and presented in Appendix B. It should be noted that the piezometers at CEG SI-1, CEG SI-3, BGC SI-1, CSA SI-1, and CSA SI-2 consist of inclinometer casings with an opening at the bottom (previously created by piercing the casing bottoms) and may or may not reflect actual open pipe piezometer water levels. Historical measurement records of the piezometers provided to SFB are included in Appendix C for reference.

1.2 Dewatering Well Outlet Pipes

Discharge from the dewatering well outlet pipes in the collector box was observed on June 30, 2016, with Drains H#1, W#2, W#5, and W#6 exhibiting a stream of water, Drains W#1, W#3, and W#4 showing dripping water. Drain H#1 is an outlet pipe that was encountered at the approximate collector box location during the construction of the collector box in the fall of 2012; it is unclear what H#1 drains. Field photographs of these outlet pipes taken on 6/20/14, 12/22/14, 8/5/15, and 6/30/16 are attached as Figure 2 for reference.

1.3 Kelok Way Observations

At the time of our 6/30/16 field reconnaissance, most of the observed cracks on pavement of the Kelok Way and cul-de-sac appeared to have been recently sealed (on a date unknown to us). We generally did not observe new cracks on the Kelok Way pavement in the area of the dewatering wells compared to cracks observed at the time of well installation in September, 2012. Near the cul-de-sac of Kelok way, the cracks and joints on the concrete driveway apron leading to 8053 Kelok Way appear to be similar to those observed on 8/5/15. Photographs taken on 5/19/10, 6/19/14, 12/22/14, 8/5/15, and 6/30/16 of the driveway are presented on Figure 3 for reference. By comparing photographs taken on 8/5/15 and 6/30/16 of the same concrete joint at 8053 Kelok Way (as shown on Figure 4), it appears that the width of the joint remained about the same. No apparent crack widening was observed on the Kelok Way pavement in the cul-de-sac area.

2.0 CONCLUSIONS AND OPINIONS

SFB completed monitoring of selected inclinometer casings, vibrating wire and open pipe piezometers, and dewatering wells and outlet pipes on June 30, 2016.

2.1 Kelok Way and North Facing Slope

By comparing to the initial readings on 6/19/14 and 6/20/14, Inclinometer Casings CSA SI-3 and W SI-1 generally do not indicate obvious horizontal movements. Inclinometer Casing CSA SI-1, appear to indicate on-going fill expansion with cumulative displacement (profile change) of about 1.6 inches at ground surface since 6/20/14. The movement at Inclinometer Casing BGC SI-1 indicates both on-going fill expansion and slope creep with cumulative displacement of about 0.8 inch since 6/20/14. Inclinometer Casings CEG SI-1, CSA SI-2, and W SI-5, indicate very slight horizontal movement (0.1 to 0.2 inch) at depths of 88, 111, and 96 feet, respectively, since the initial readings were taken. These movements are probably related to the very slow creep along the existing buried deep-seated old slide plane in the area.

2.2 Kelok Way Cul-de-sac

The monitoring of casing at CSA SI-4 was not completed due to passage obstruction caused by excessive casing deformation at a depth of about 52 feet below the ground surface. The combined results of the CSA SI-4 monitoring and the observed cracks within the Kelok Way cul-de-sac generally indicate that the slope below the cul-de-sac is unstable and continues to move downhill under static conditions. Greater rates of movement (including large magnitudes of movement) will likely occur when the slope is subjected to earthquake shaking, increases in water pressures, and/or decreases in shear strength.

The past slope movement in the area of CSA SI-4 has caused movement of the Kelok Way cul-de-sac, associated infrastructure, and the home and improvements at 8053 Kelok Way. The home at 8053 Kelok Way has clearly undergone detrimental movement that affects the structural integrity of the house. At the time of our 6/30/16 field reconnaissance, the house appeared to be unoccupied. Future slope movement will result in significant and detrimental damage to the public and private property and associated improvements located upslope and downslope of CSA SI-4 shown on Figure 1. The magnitude of damage and when the damage will occur cannot be accurately predicted due to numerous variables. We recommend a replacement inclinometer casing be installed in the area for further monitoring. Serious consideration should be given to stabilizing the movement and repairing the damage. We also recommend the existing infrastructure (including underground utilities) be inspected to determine if detrimental damage has occurred. Any damage to water bearing utilities should be repaired immediately to reduce

the potential for subsurface water breaks that could decrease the stability of the slope and potentially cause slope failure.

2.3 Piezometers

The results of our vibrating wire and open pipe piezometer monitoring generally showed similar results as those indicated by historical monitoring records. The measured groundwater levels in the piezometers generally indicated about the same groundwater level conditions on 6/30/16 compared to the previous monitoring results on 8/5/15. The discharge conditions of dewatering well outlet pipes are similar to what was observed at the completion of the wells.

We recommend outlet pipes in the collector box shown on Figure 1 be hand cleared of any built up debris or deposits. We recommend this removal occur on a yearly basis. To increase the water discharge from Wells W#1, W#3, and W#4, consideration should be given to installing sump pumps directly into the wells located within Kelok Way and discharging the pumped water to the existing storm drain system. Dewatering the wells may increase the stability of the hillside.

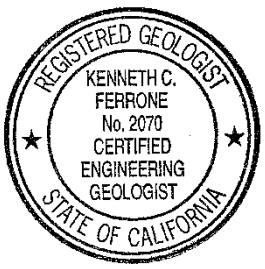
2.4 Closing

Should you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,

Stevens, Ferrone & Bailey Engineering Company, Inc.

Ken Ferrone, PE, GE, CEG
Civil/Geotechnical Engineer
Certified Engineering Geologist



TC/KCF
Copies: Addressee (1 by e-mail)

FIGURES

KEY

- Approximate Locations of Inclinometer Casings, Vibrating Wire Piezometers, Open Pipe Piezometers & Dewatering Wells Monitored by SFB
- Approximate Location of Dewatering Well Outlet Pipe Collector Box Monitored by SFB
- Approximate Locations of Inclinometer Casings, Vibrating Wire Piezometers & Open Pipe Piezometers Not Monitored by SFB

NOTE: *Base Map Taken From As-Built Rough Grading Plan of Northeast Valley - Tracts 7260, 7261 & 7264 Prepared by UDI-Tetrad Consulting Engineers, Inc. and Dated Oct 1996, and Google Earth Image.*

APPROXIMATE SCALE: 1" = 150'
0 150' 300'

DATE	PROJECT NO.
July 2014	555-2

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Concord, CA 94520
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www.SFandB.com

SITE PLAN	FIGURE
KELOK WAY MONITORING LOCATION MAP Clayton, California	1

Figure 2, Photograph of Outlet Pipes

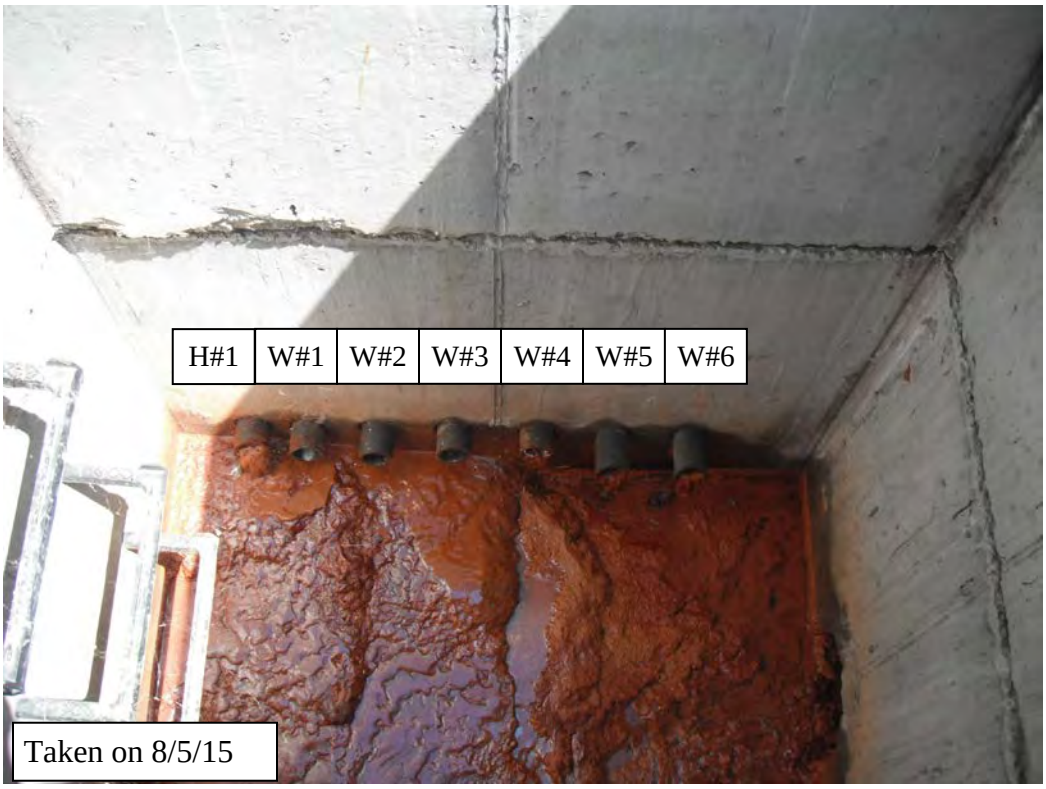


Figure 2 (Continued), Photograph of Outlet Pipes

Figure 3, 8053 Kelok Way

Figure 3 (Continued), 8053 Kelok Way

Taken on 6/30/16

Figure 3 (Continued), 8053 Kelok Way

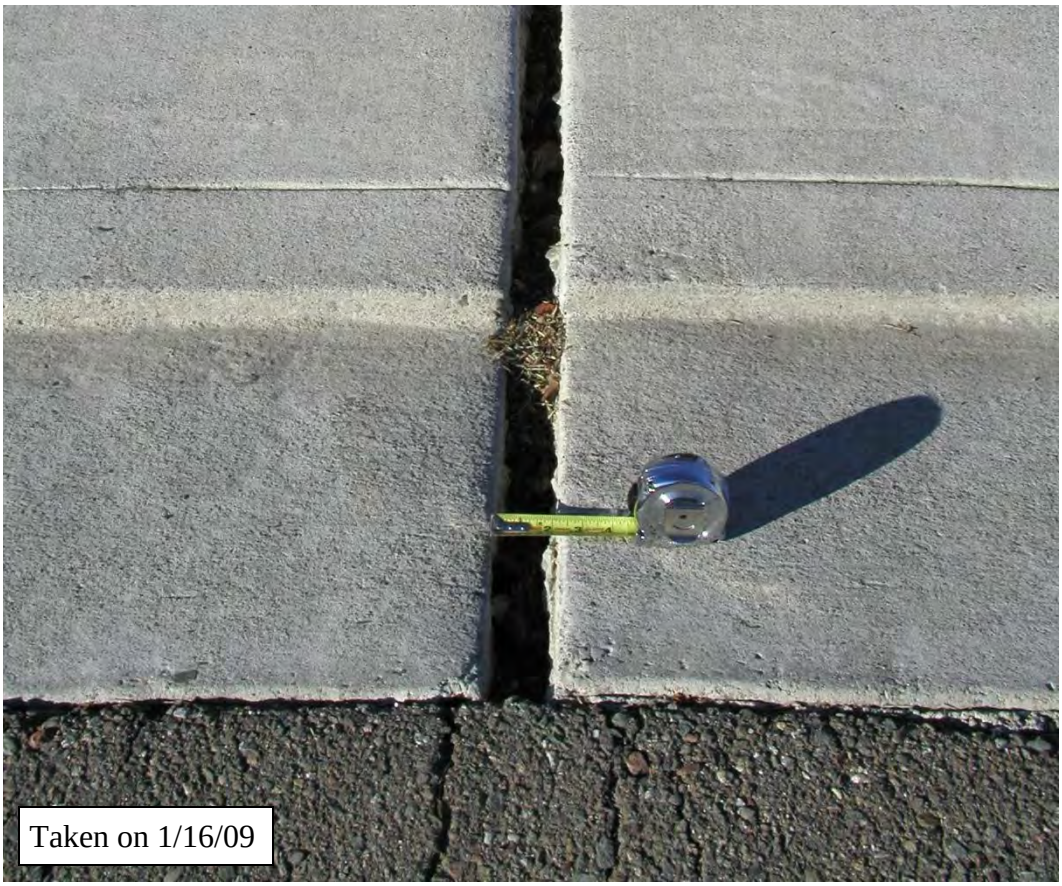


Figure 4, 8053 Kelok Way

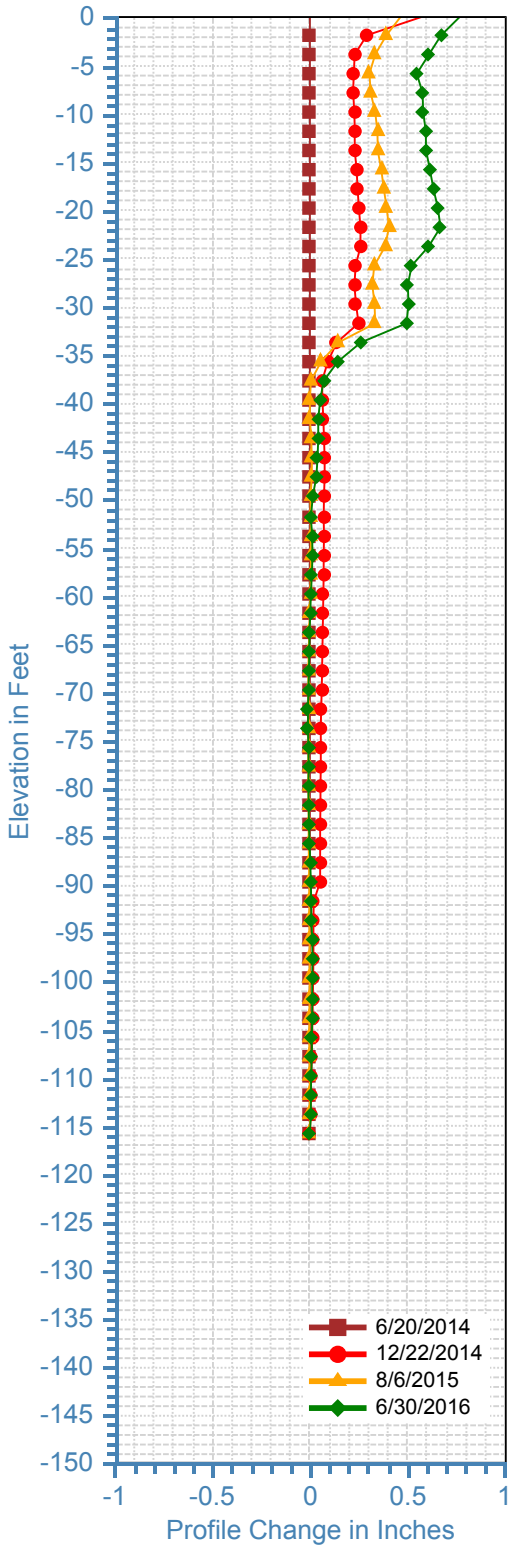
Figure 4 (Continued), 8053 Kelok Way

Figure 4 (Continued), 8053 Kelok Way

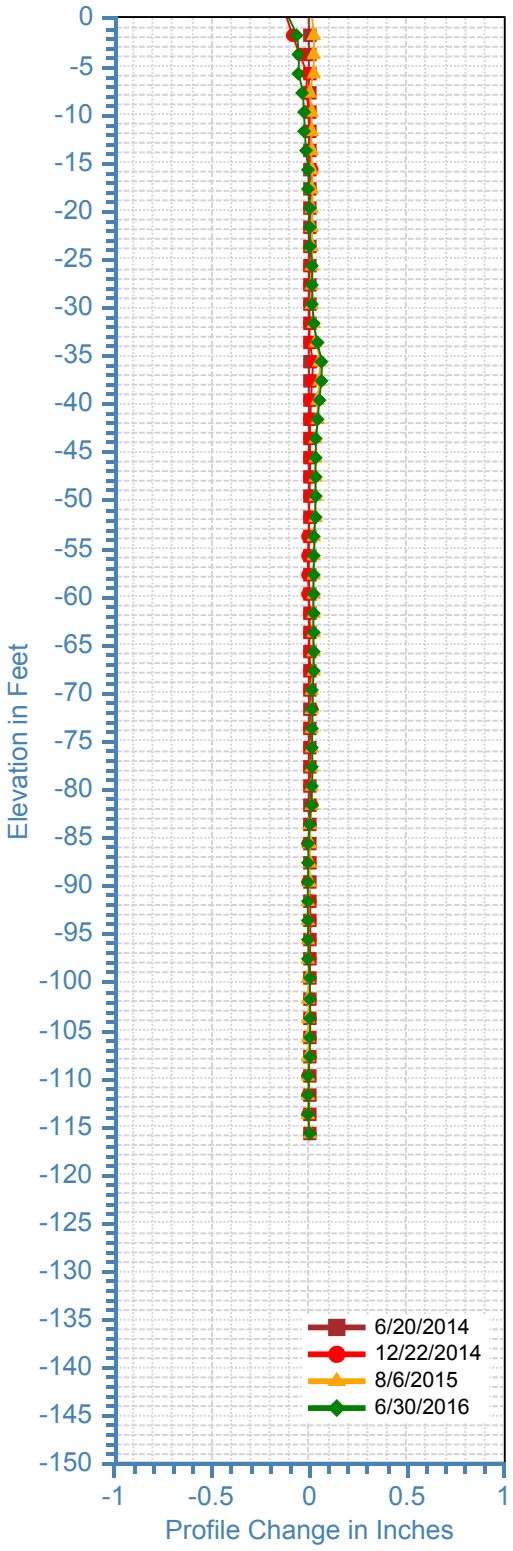
APPENDIX A

Inclinometer Casing Readings

555-2 BGC SI-1, A-Axis



555-2 BGC SI-1, B-Axis



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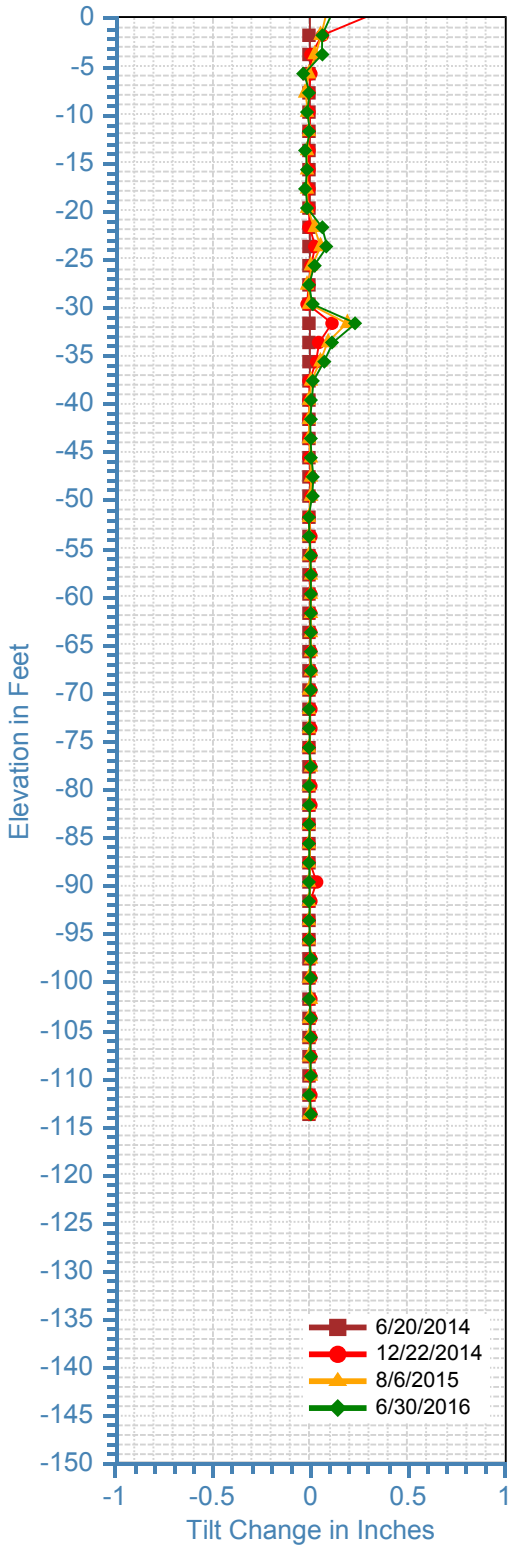

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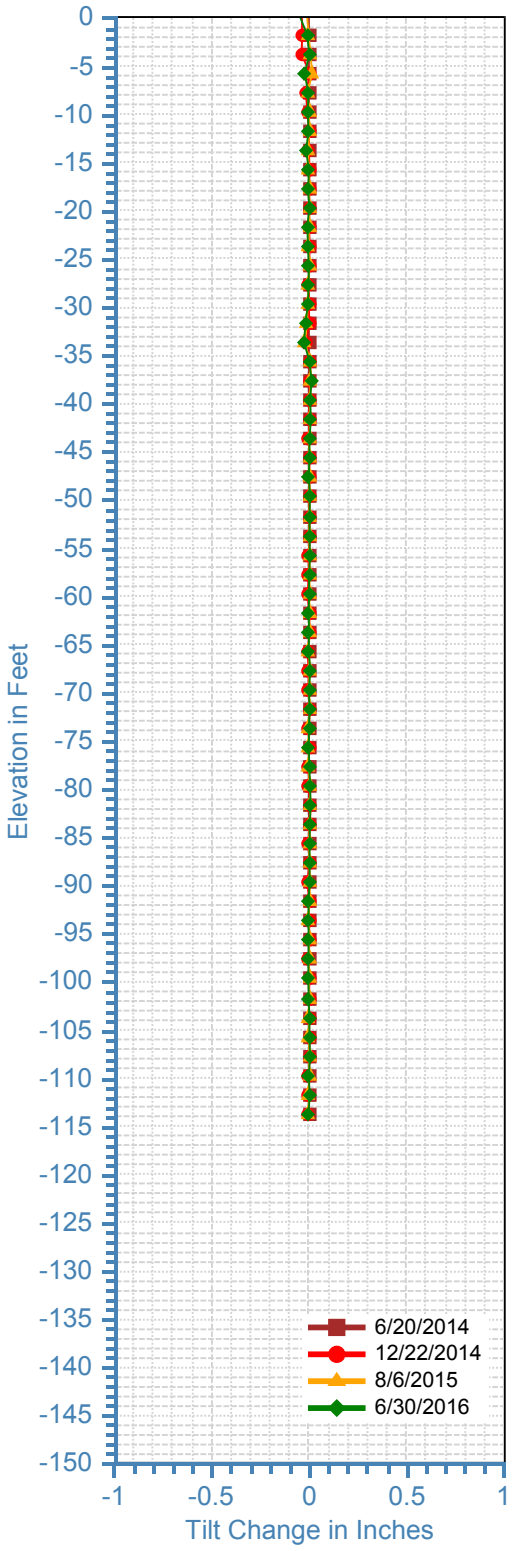
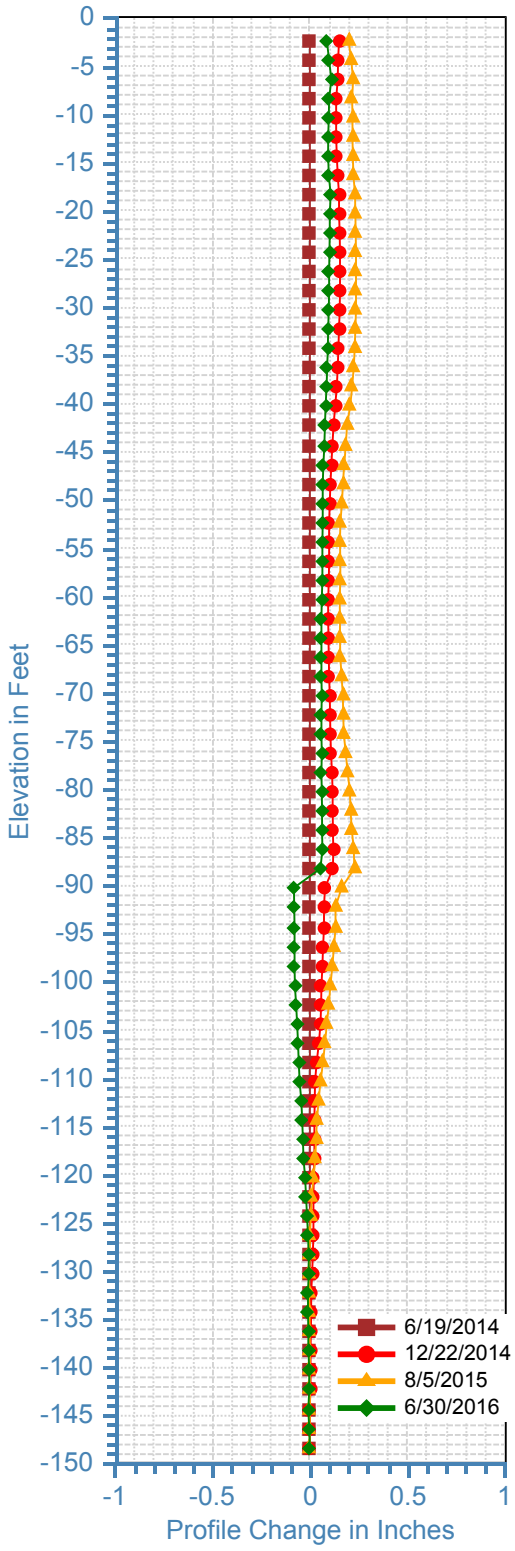


555-2 CEG SI-1, A-Axis



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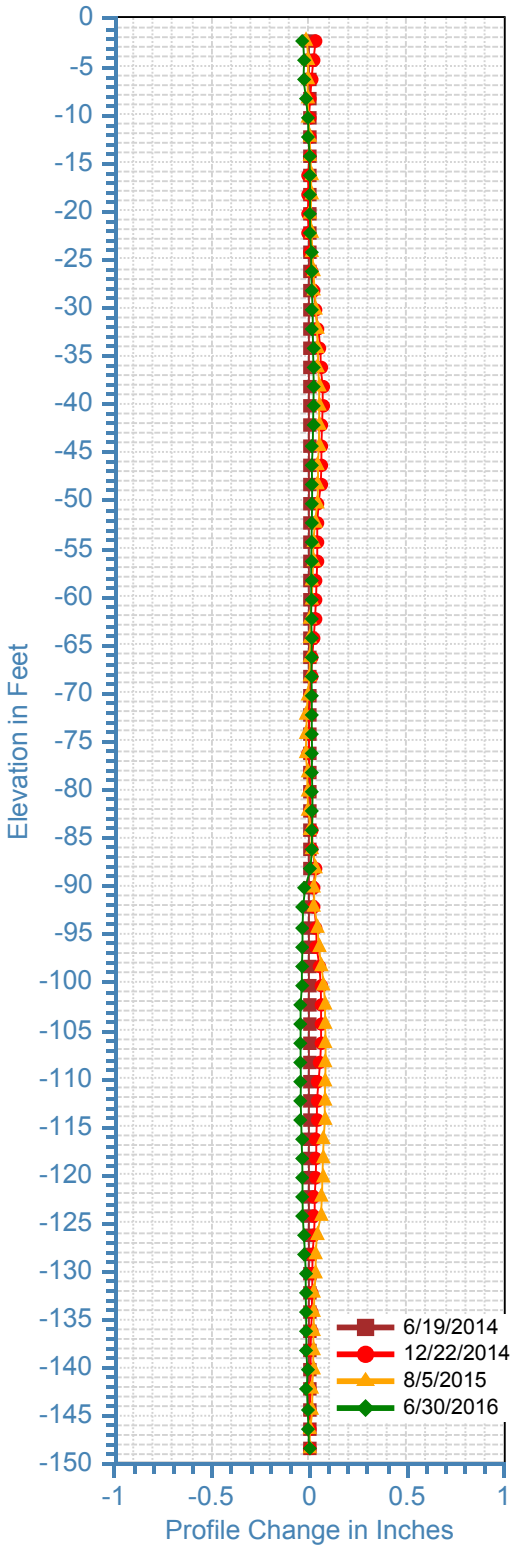
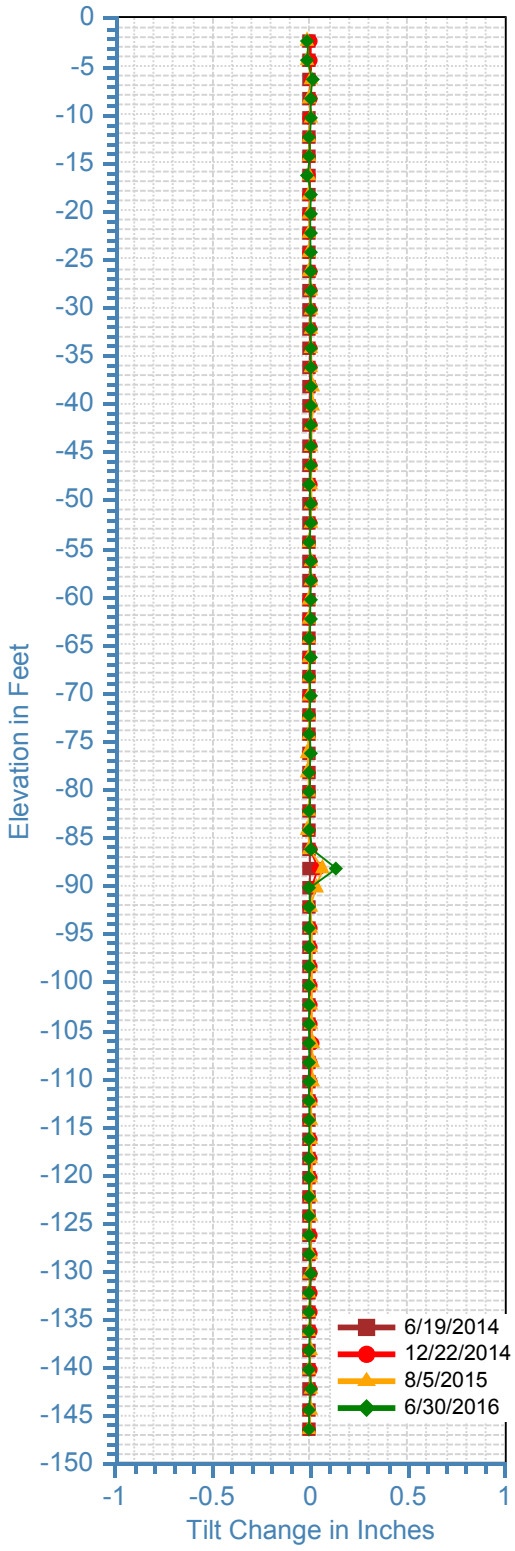


555-2 CEG SI-1, A-Axis



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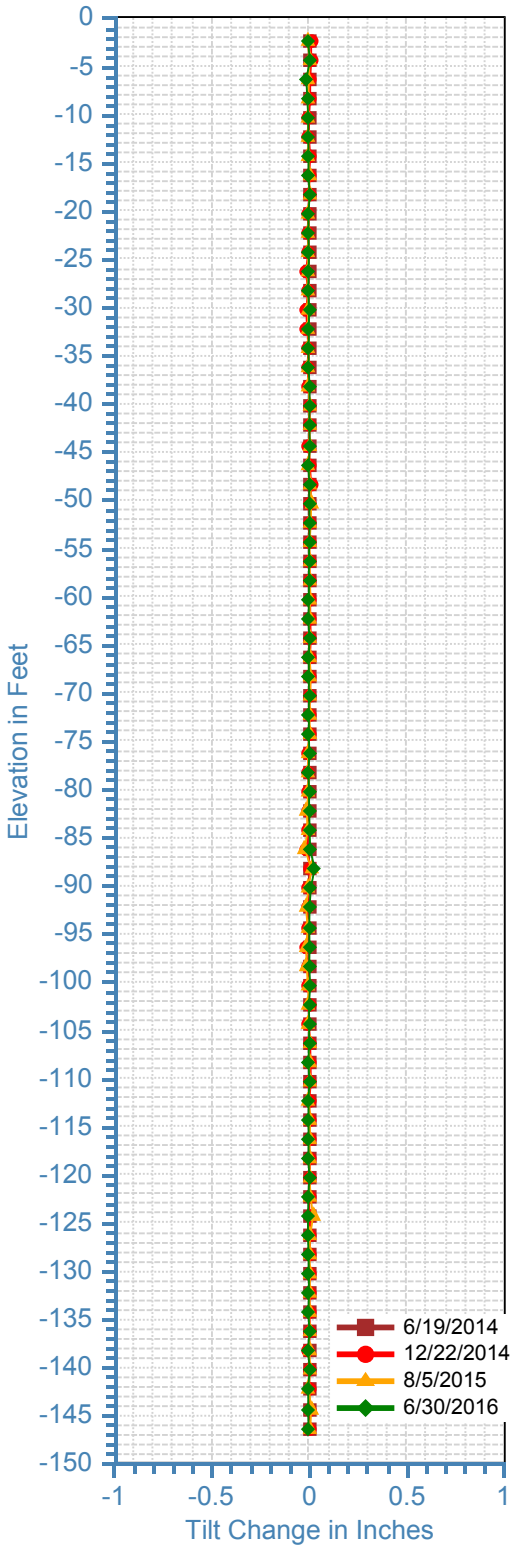
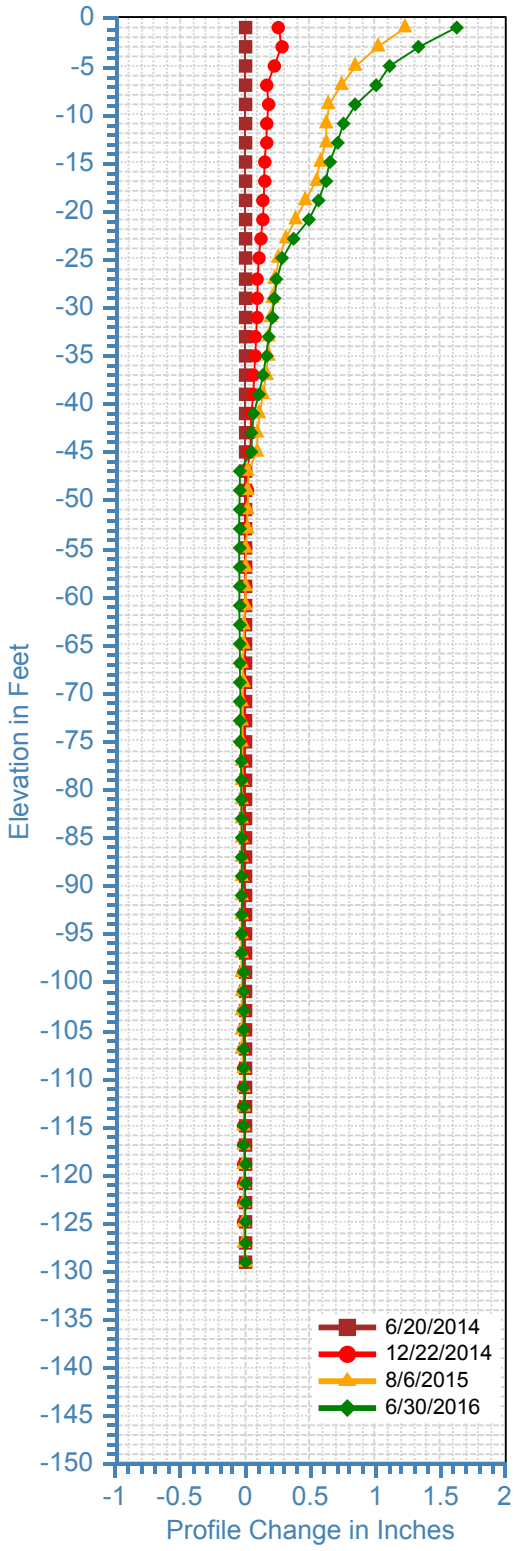


555-2 CSA SI-1, A-Axis



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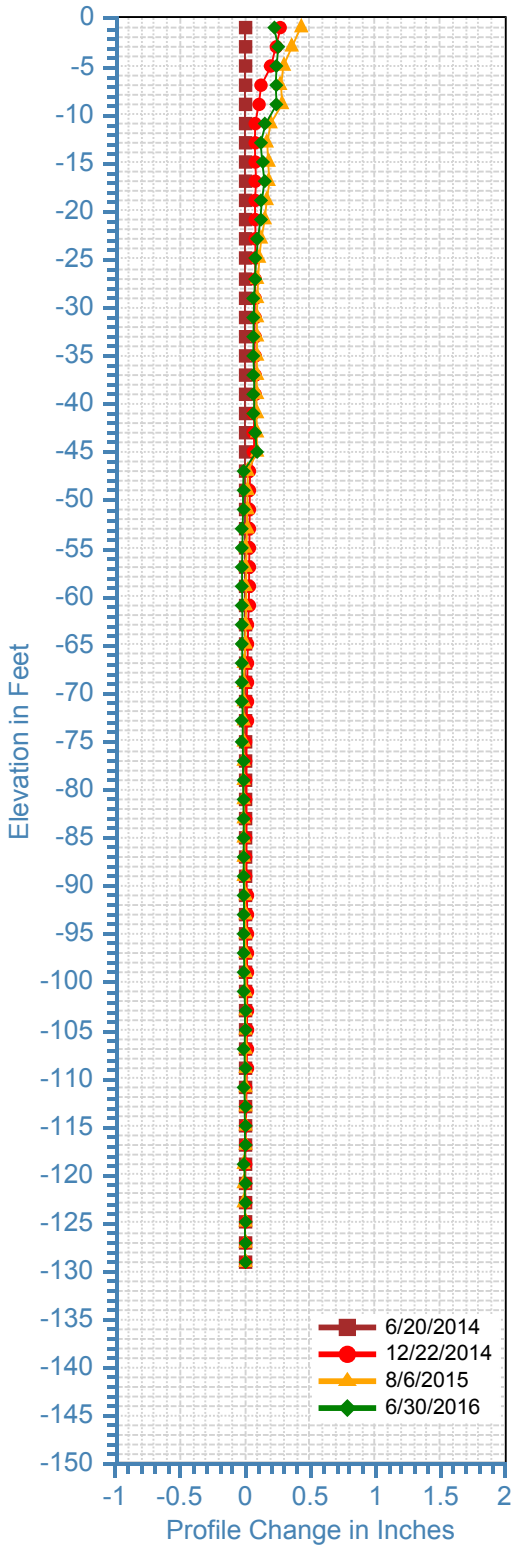
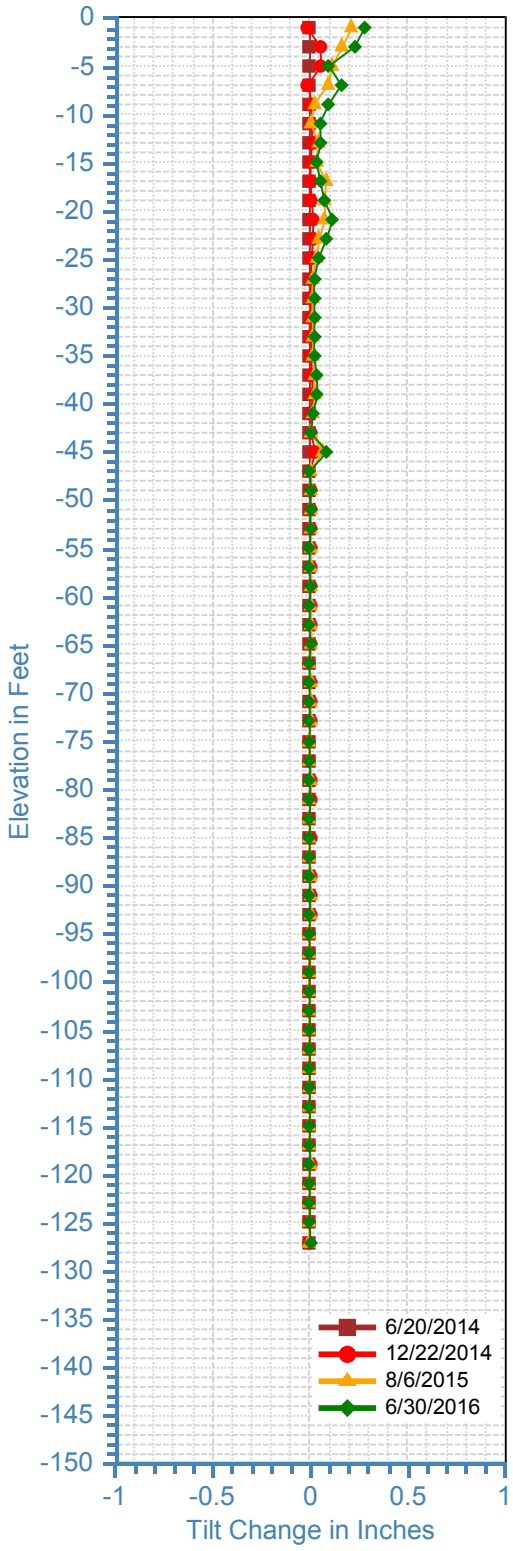
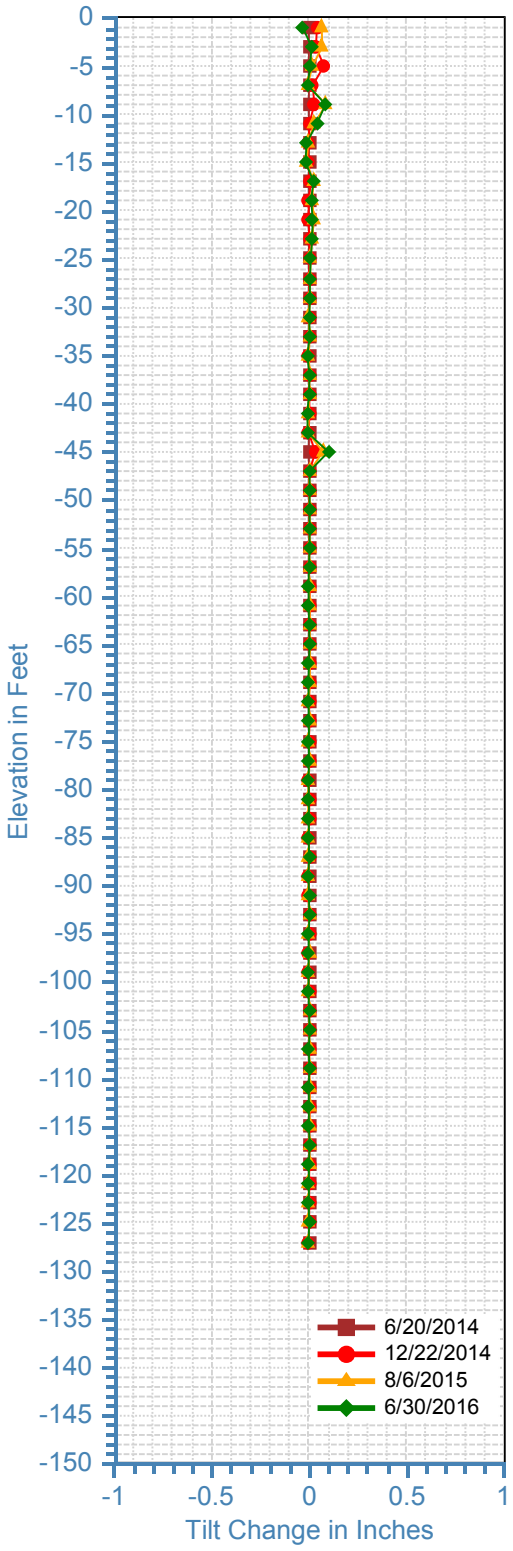


555-1 CSA SI-1, A-Axis



555-2 CSA SI-1, B-Axis



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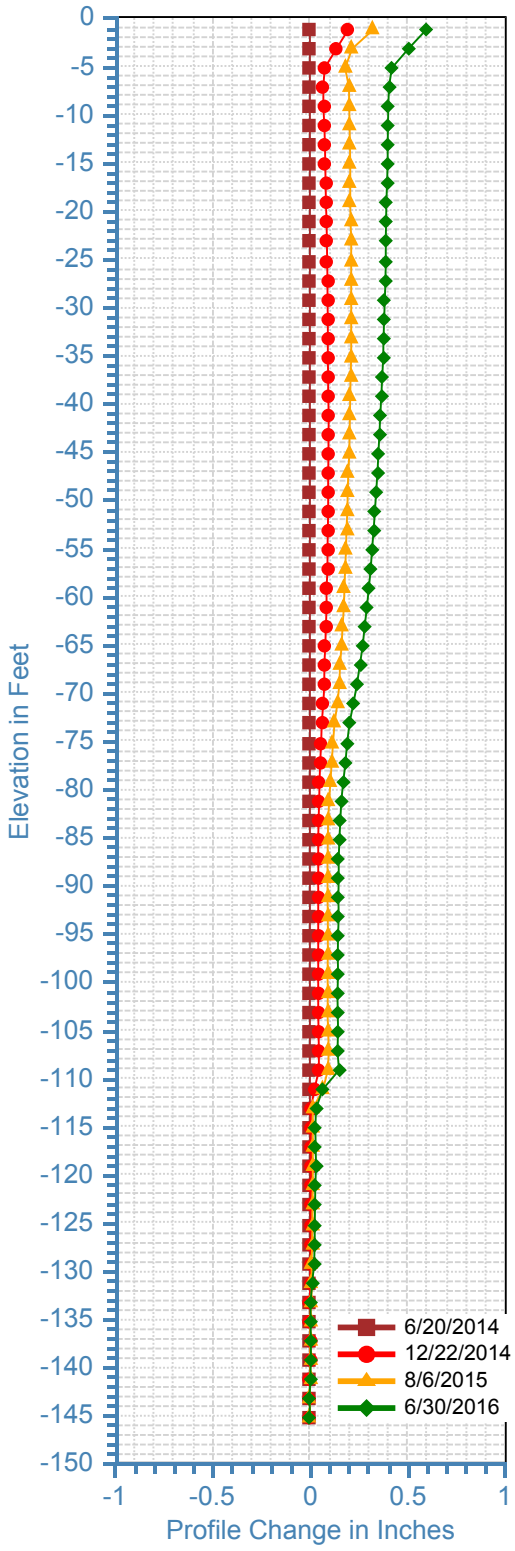
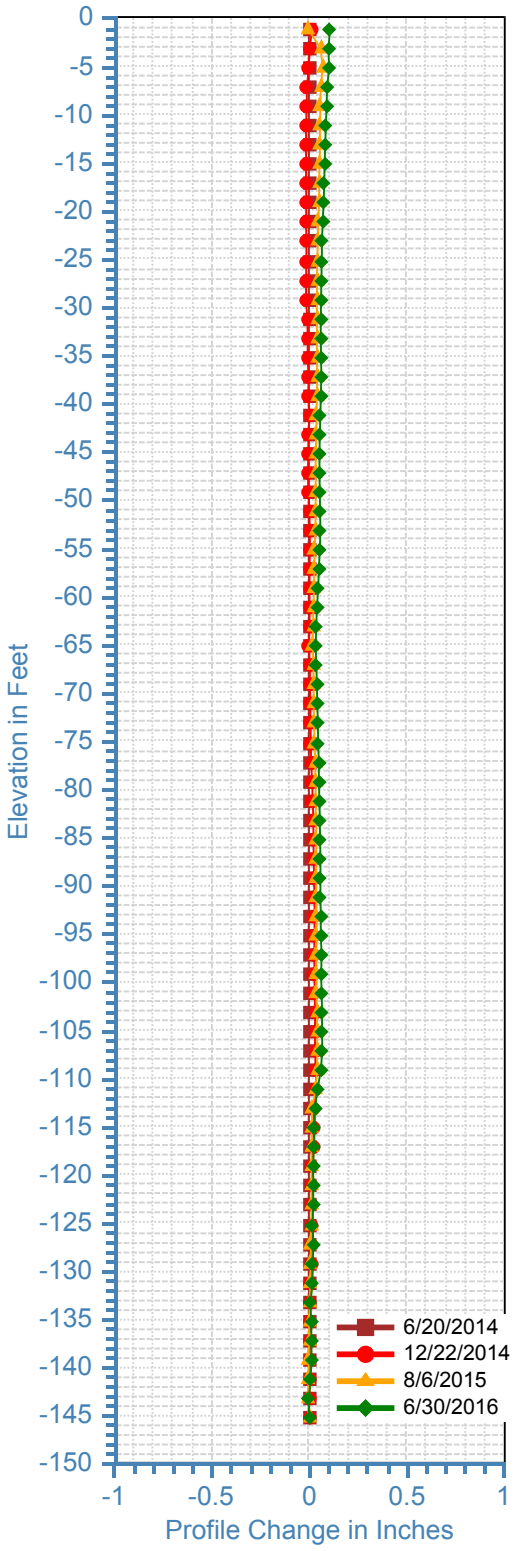
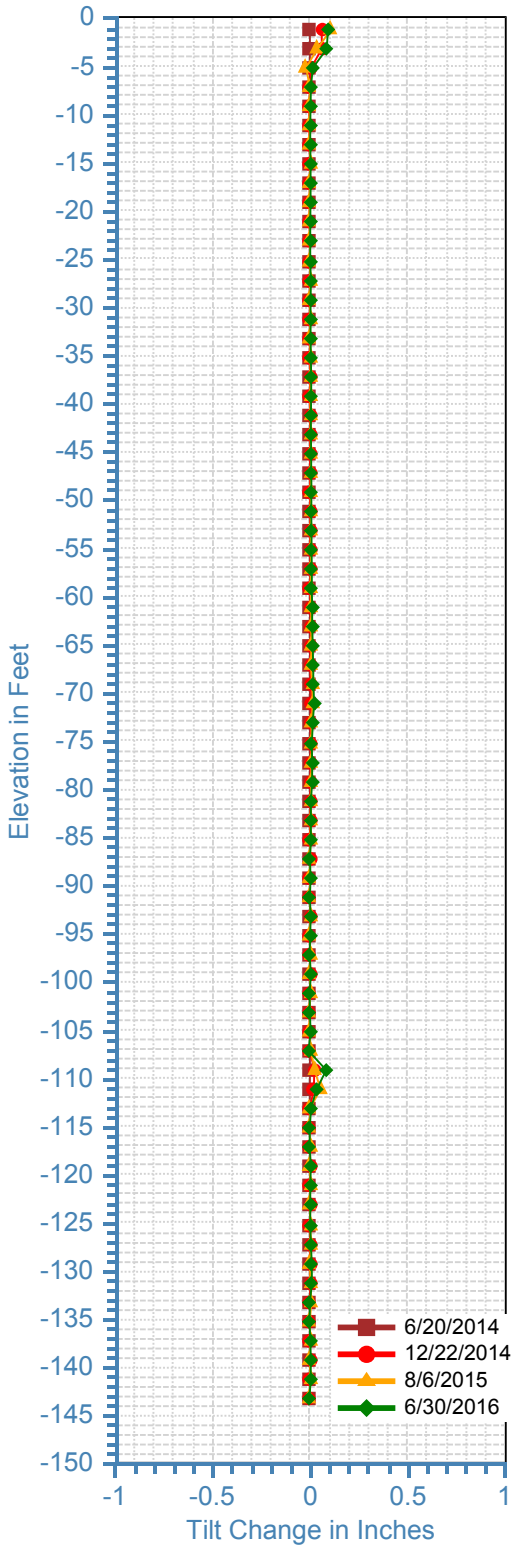


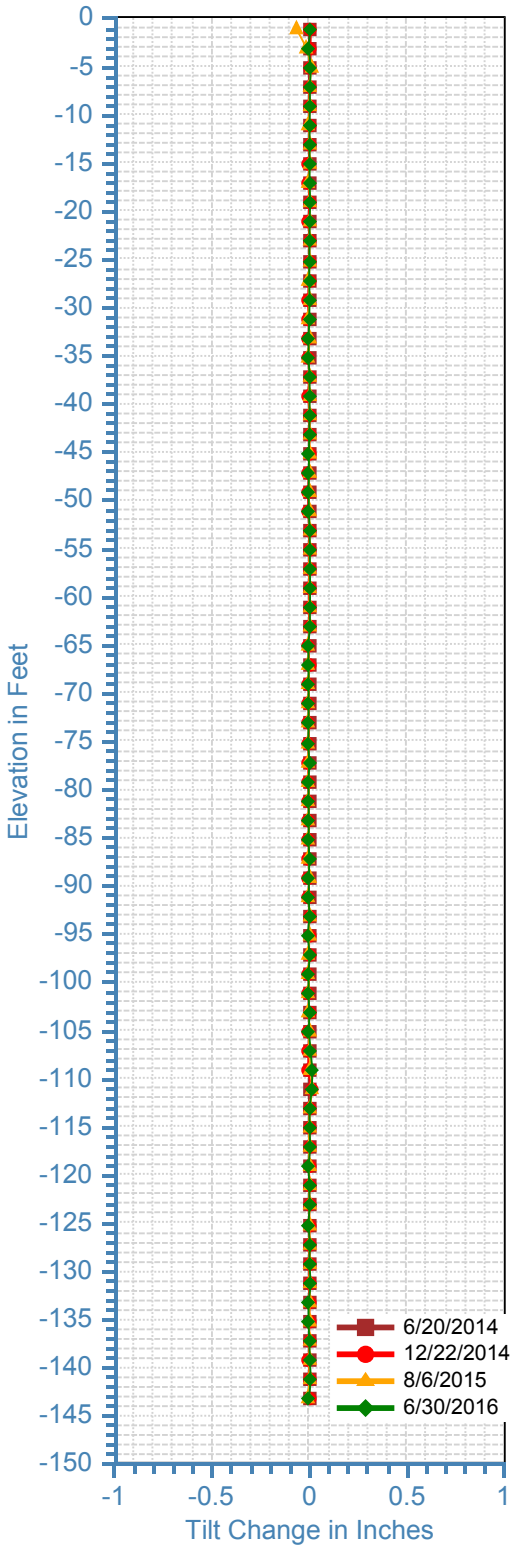
555-2 CSA SI-2, B-Axis



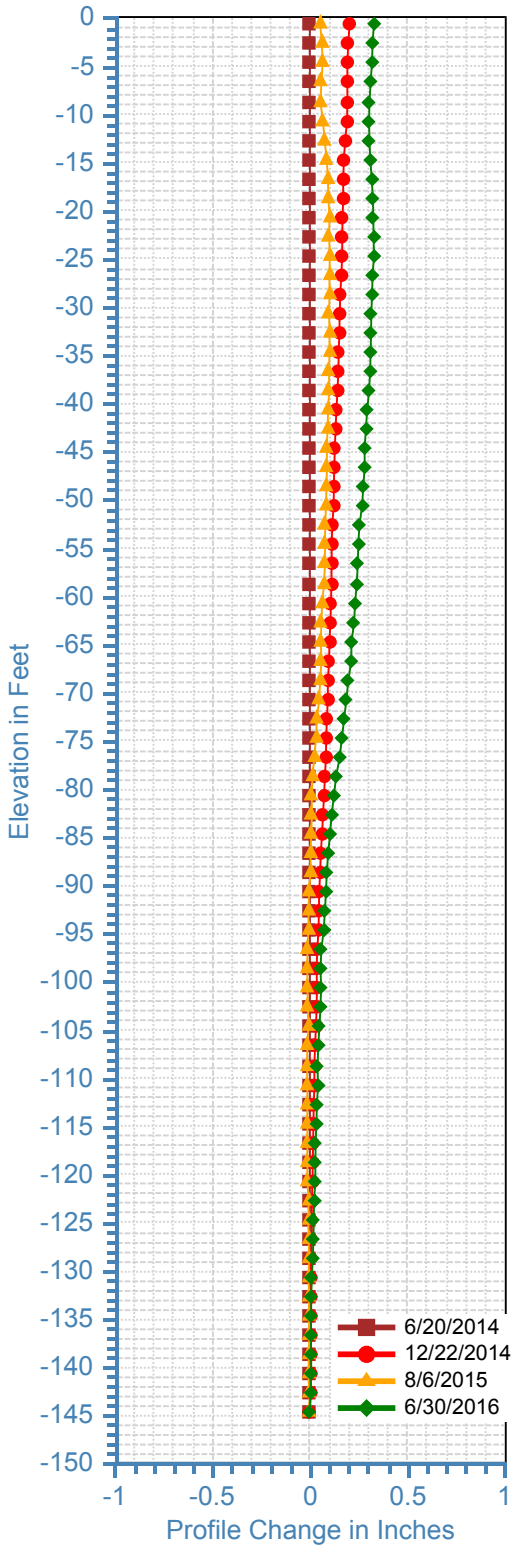
555-2 CSA SI-2, A-Axis



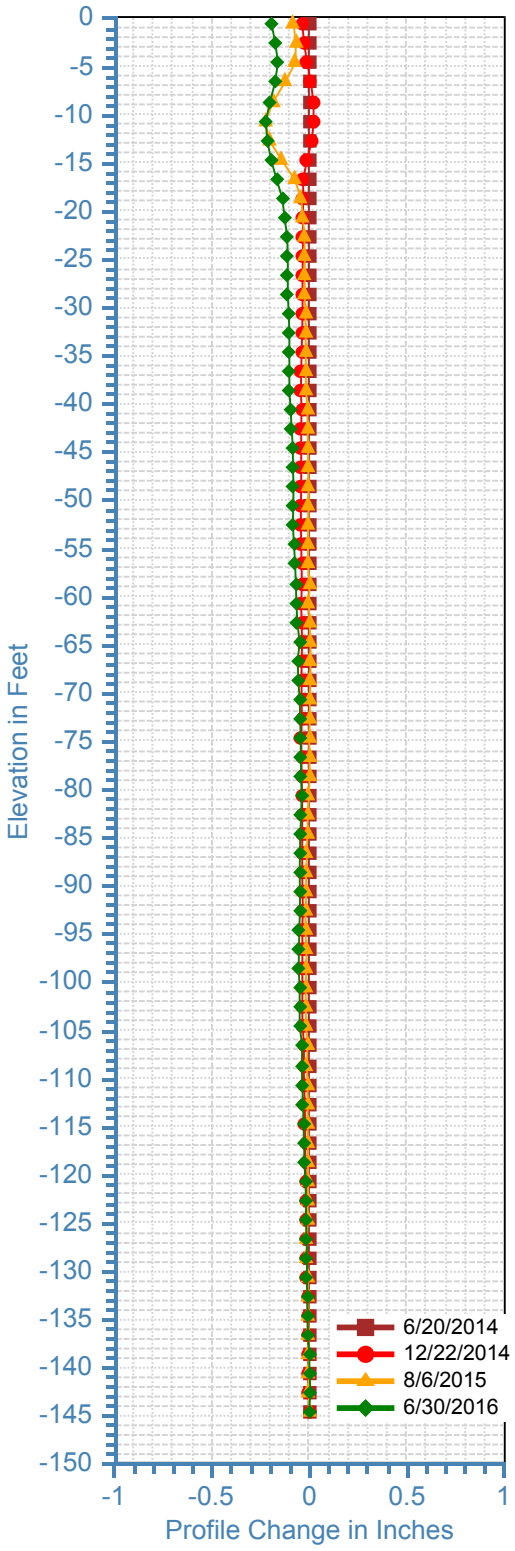
555-2 CSA SI-2, B-Axis



555-2 CSA SI-3, A-Axis



555-2 CSA SI-3, B-Axis



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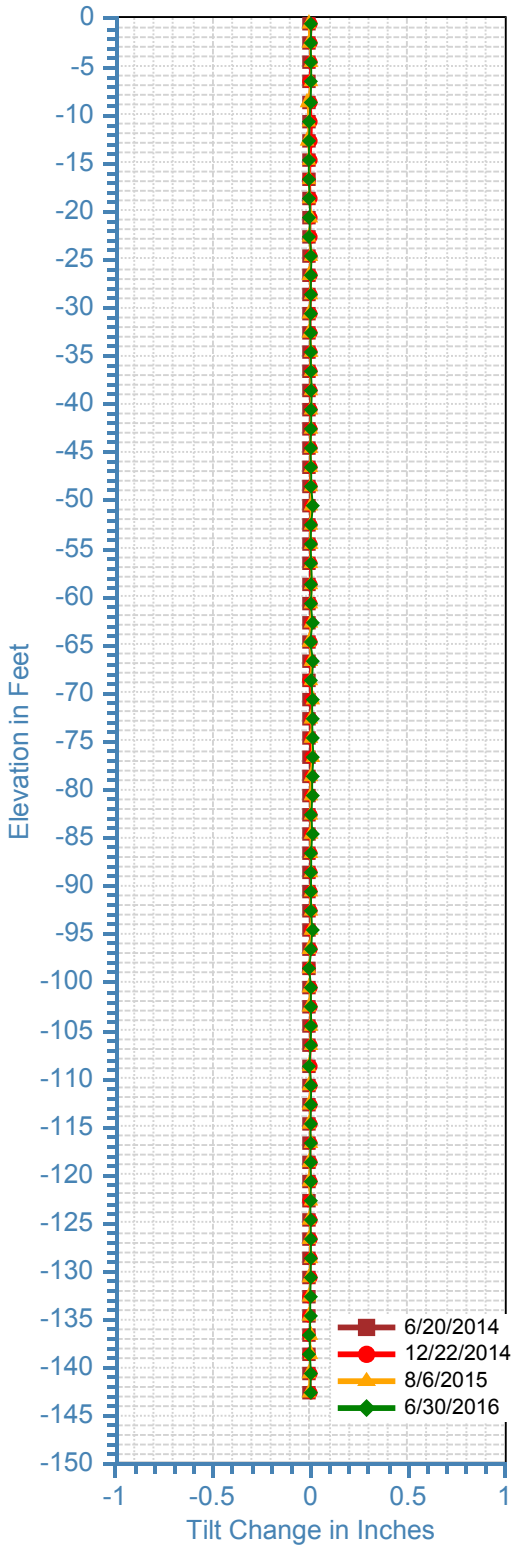

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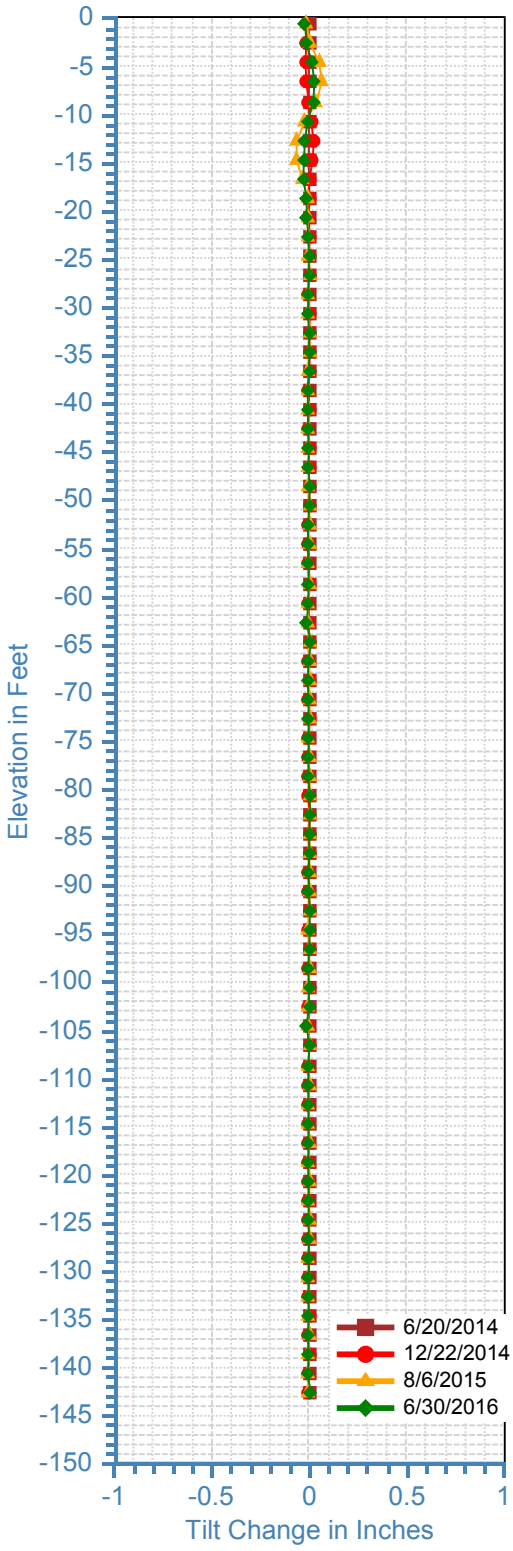
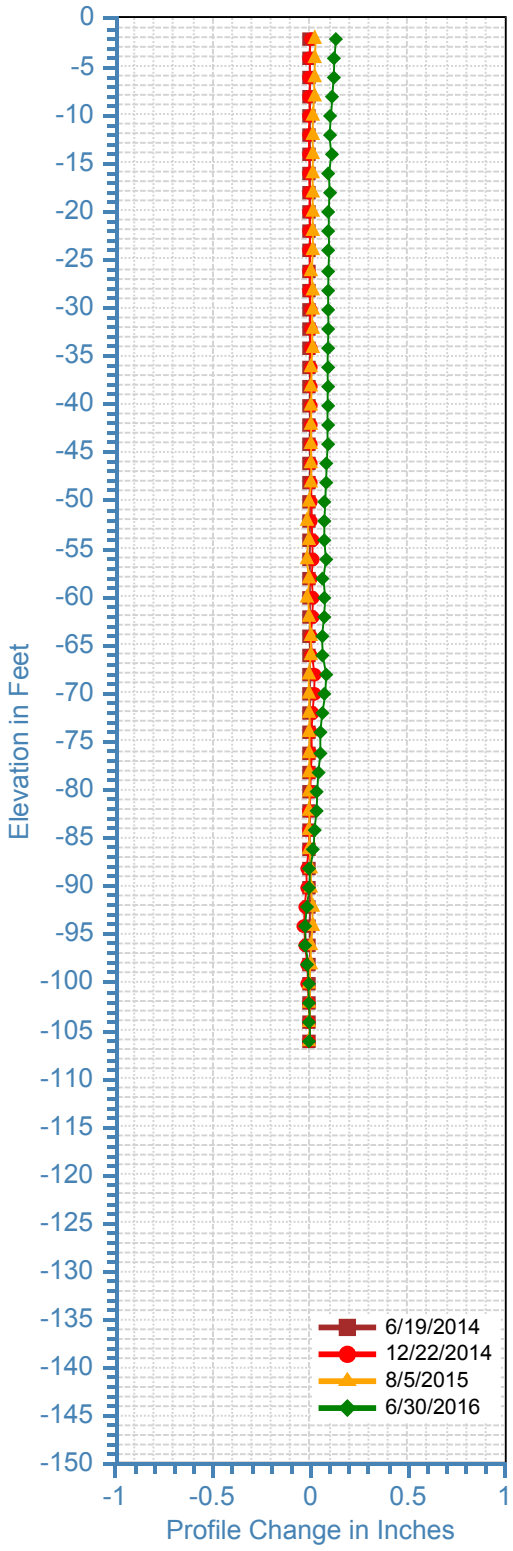


555-2 W-1, A-Axis



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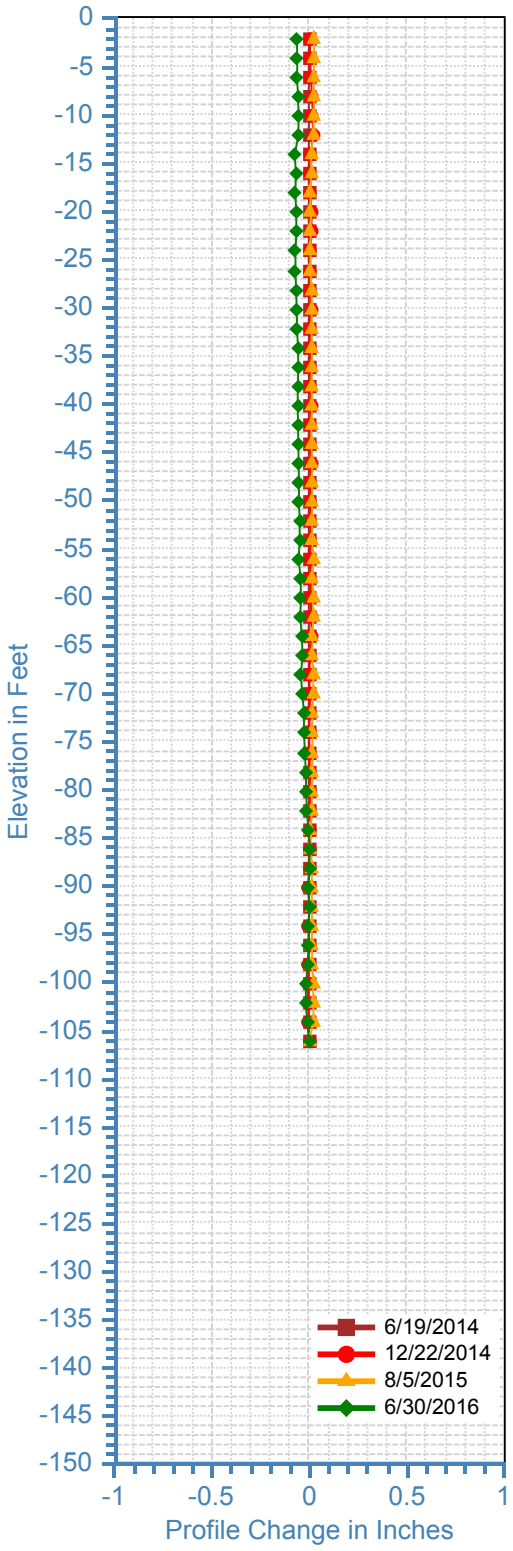

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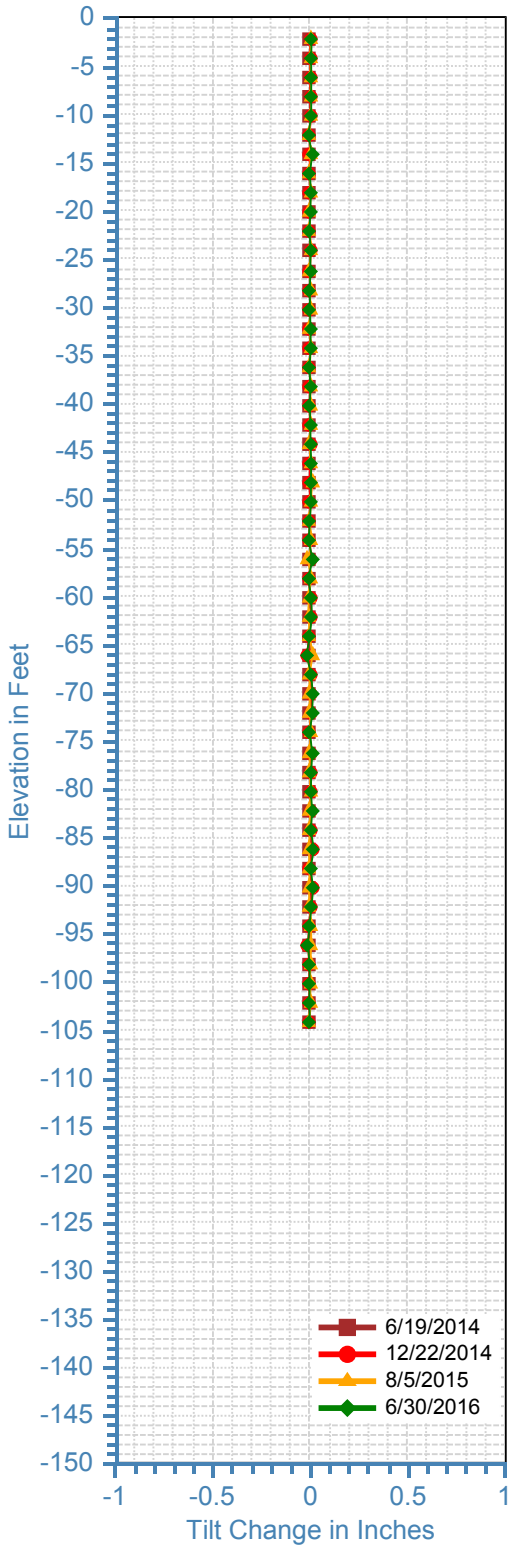

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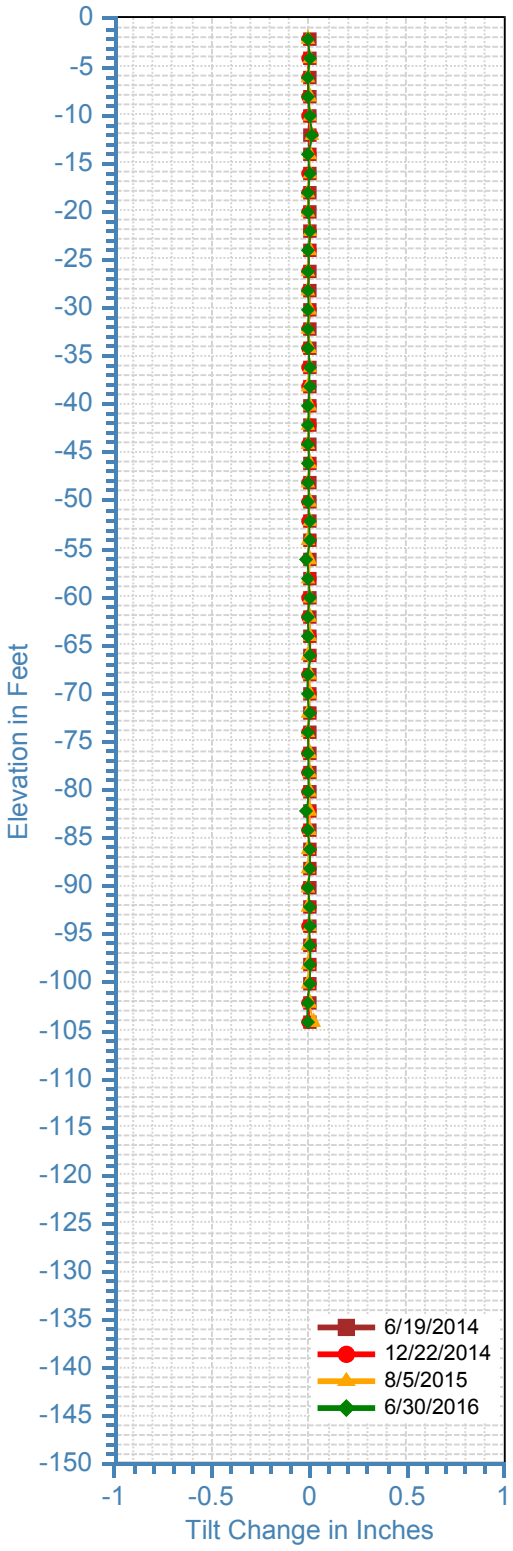
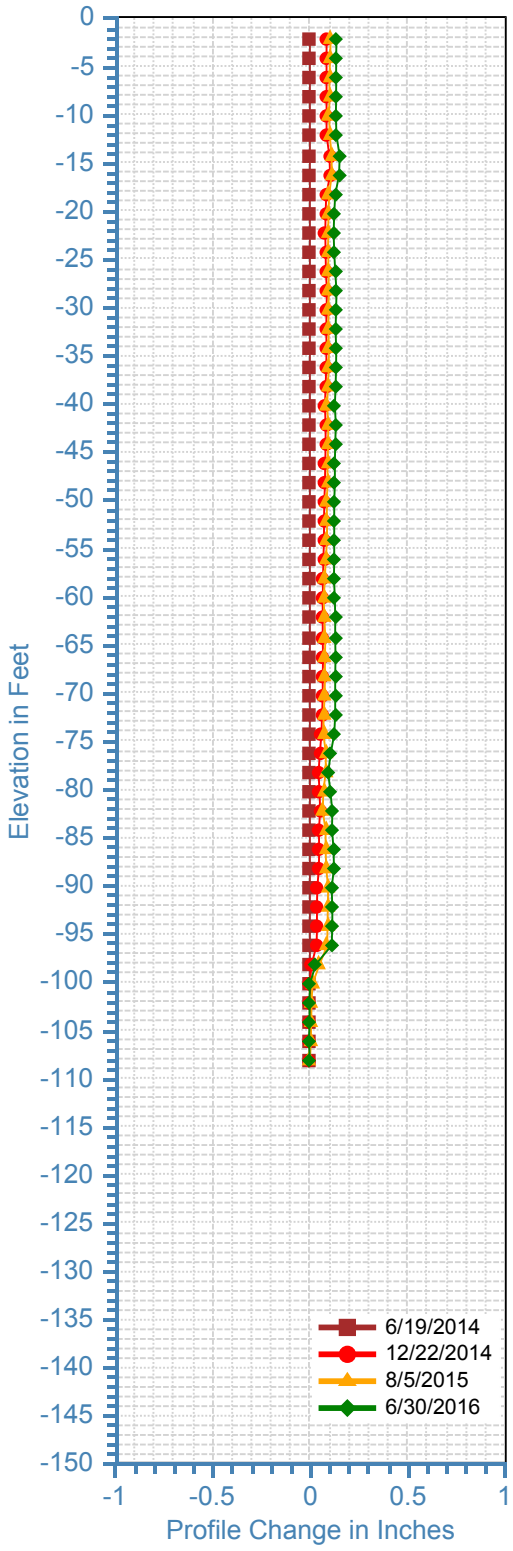


555-2 W-5, A-Axis



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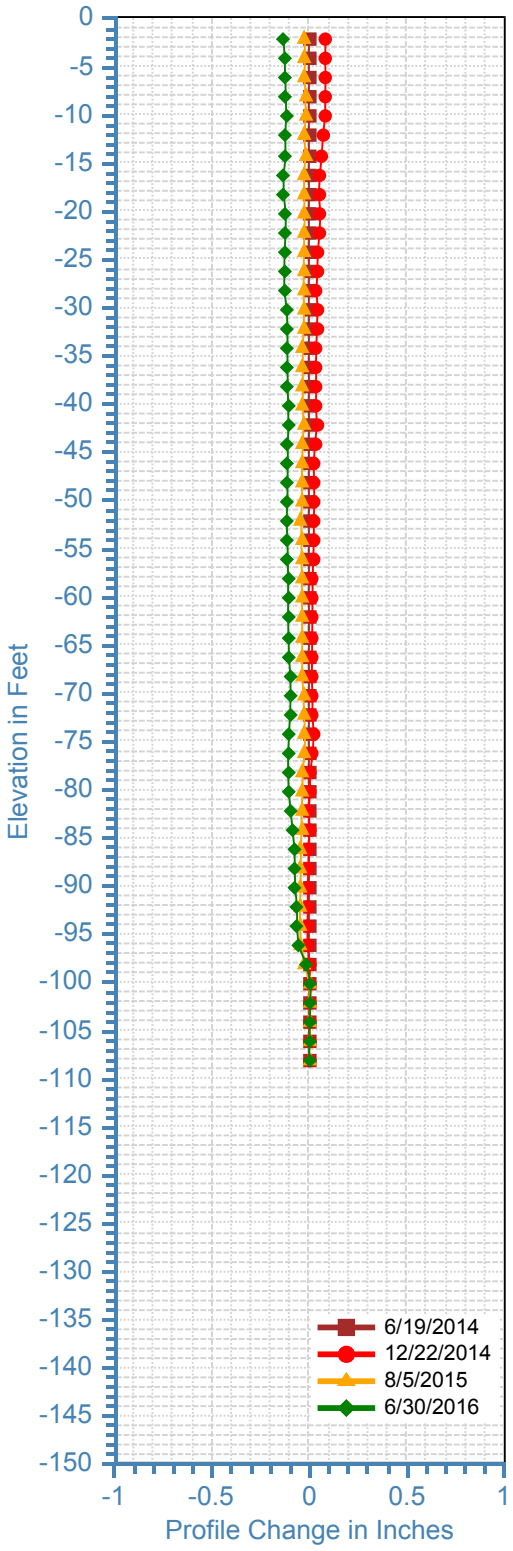

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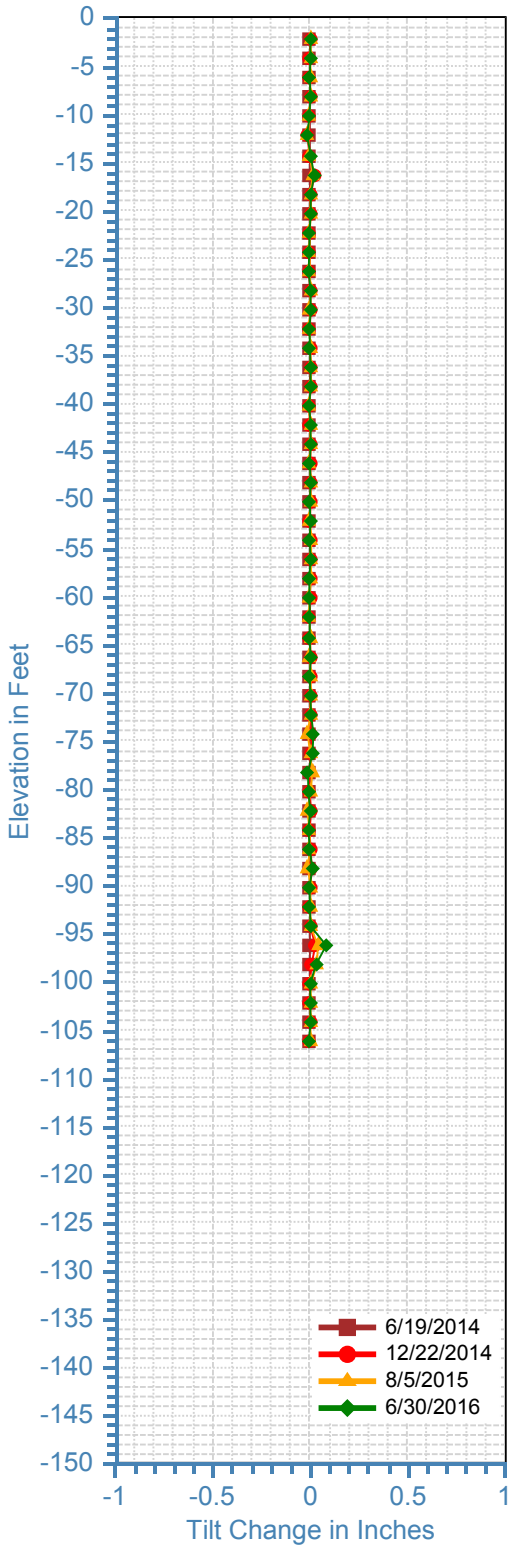

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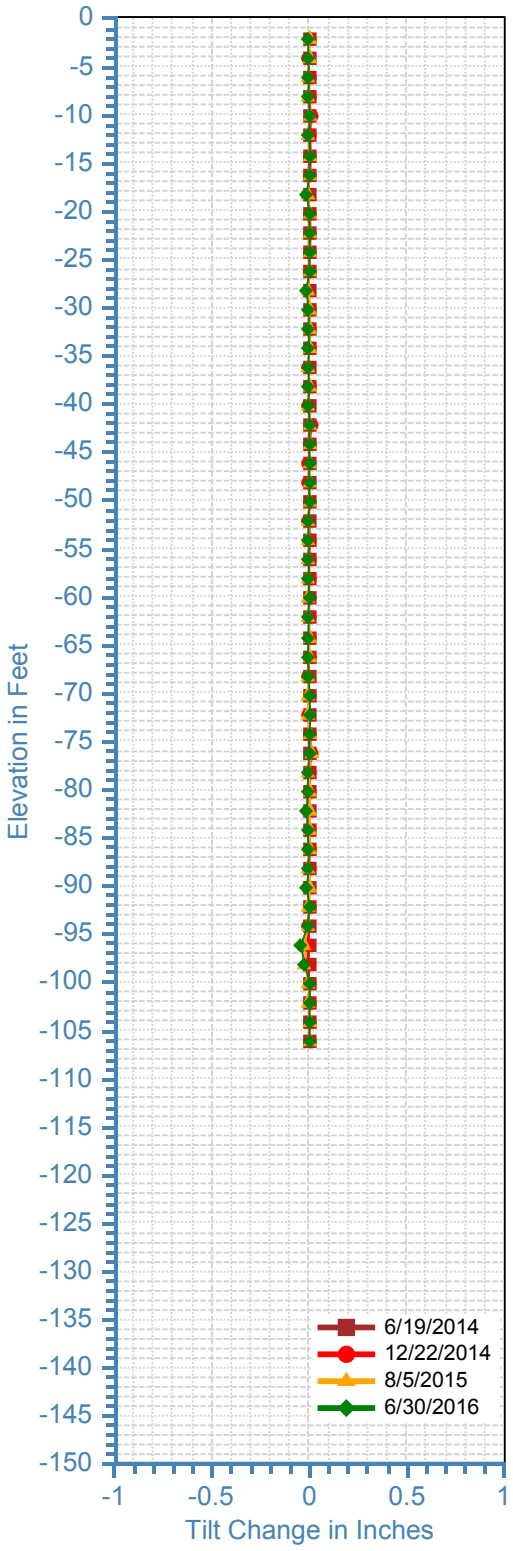

APPENDIX B

Vibrating Wire and Open Pipe Piezometer Measurements

SFB 555-2

Kelok Way Monitoring, Clayton, CA

Date of Monitoring: 6/30/2016

Open Standpipe Piezometer	Depth to GW (ft)
W SI-1	25.4
W-2	38.3
W-3	25.4
W-4	26.2
W SI-5	83.1
W-6	85.6
CEGPZ-1	24.0
CEGPZ-2	47.3
MW-1	23.4
CEGSI-1*	11.9
CEGSI-3*	24.6
BGCSI-1*	60.7
CSASI-1*	64.3
CSASI-2*	49.2

*Note: Inclinometer casing with open bottom.

VW Piezometer	Depth (ft)	S/N	R0	T0 (°C)	G	K	Hz	T1(°C)	R1	P (psi)	P (psf)	Water (ft) Above VW Piezo	Depth to GW (ft)
CSA-1	36	07-17286	9110	22.8	0.01497	-0.01814	3027.7	16.8	9167.0	-0.7440	-107.1	-1.7	Dry**
	70	07-13836	8876	21.8	0.02439	-0.01615	2941.7	16.6	8653.6	5.5083	793.2	12.7	57.3
	125	07-14513	9095	21.0	0.02356	-0.03009	2838.8	16.8	8058.8	24.5396	3533.7	56.6	68.4
CSA-2	77	07-17287	9002	22.4	0.01562	-0.01583	3012.7	17.3	9076.4	-1.0808	-155.6	-2.5	Dry**
	97	07-13835	8874	21.9	0.02318	-0.02480	2930.6	17.1	8588.4	6.7389	970.4	15.6	81.4
	127	07-14512	8278	22.2	0.02452	-0.02357	2699.0	17.3	7284.6	24.4736	3524.2	56.5	70.5
CSA-3	77	07-17309	8954	22.1	0.01842	-0.02201	2990.5	17.1	8943.1	0.3110	44.8	0.7	76.3
	97	07-15712	8901	21.5	0.02413	-0.02937	2896.1	17.5	8387.4	12.5108	1801.5	28.9	68.1
	127	07-15716	8914	21.4	0.02465	-0.02996	2792.0	17.6	7795.3	27.6907	3987.5	63.9	63.1
CSA-4	44	07-17310	8894	22.2	0.01538	-0.00761	3004.0	16.6	9024.0	-1.9570	-281.8	-4.5	Dry**
	60	07-15711	7692	21.1	0.02356	-0.00656	2789.0	16.1	7778.5	-2.0056	-288.8	-4.6	Dry**
	125	07-15715	8929	21.3	0.02343	-0.02363	2817.8	16.7	7940.0	23.2810	3352.5	53.7	71.3

**Note: No positive water pressure measured by VW piezometer.

APPENDIX C

Historical Piezometer Measurement Records

SFB 555-2

Kelok Way Monitoring, Clayton, CA

Measured Groundwater Level in Feet Below Ground Surface

Monitored by	CEG	CEG	CEG	CEG	CEG	CEG	CEG	CEG	CEG	CEG	CEG	CEG	CEG	CEG	SFB	SFB	SFB	SFB	SFB
Open Standpipe Piezometer	9/24/07	10/18/07	4/3/08	6/26/08	1/15/09	1/27/10	3/24/10	9/31/10	1/28/11	5/10/11	5/16/11	6/3/11	6/20/11	7/22/11	11/29/12	6/19/14 to 6/20/14	12/22/14	8/5/2015	6/30/2016
W SI-1															22.4	23.8	22.5	25.1	25.4
W-2															37.3	33.1	27.4	39.5	38.3
W-3															26.1	20.4	18.4	25.4	25.4
W-4															25.6	23.4	23.8	25.6	26.2
W SI-5															83.2	83.2	83.2	83.2	83.1
W-6															85.7	85.6	85.6	85.7	85.6
CEGPZ-1	23	22.3	23.7	22.2	24.4	23.4	24.1	23.1	23.1	21.8				21		22.2	22.3	23.6	24.0
CEGPZ-2	46.5	45.9	46.2	45.8	46.2	45.7	46.9	46.4	46.9	46.4				46		47.0	47.3	46.7	47.3
MW-1											15.2	17.3	17.2	17.5		21.0	22.0	22.4	23.4
CEGSI-1*												49.0	35.0	22.5		10.6	10.7	10.9	11.9
CEGSI-3*																21.4	22.9	26.0	24.6
BGCSI-1*														66.2		61.6	61.4	61.0	60.7
CSASI-1*														71.9		66.3	65.8	65.3	64.3
CSASI-2*														86.1		57.6	55.3	52.7	49.2

*Note: Inclinometer casing with open bottom.

Monitored by		CEG	CEG	CEG	CEG	CEG	CEG	CEG	SFB	SFB	SFB	SFB
VW Piezometer	Depth (ft)	1/13/09	12/2/09	3/4/10	9/30/10 to 10/1/10	1/28/11 to 1/31/11	5/10/11 to 5/16/11	7/22/11	6/19/14 to 6/20/14	12/22/14	8/5/15	6/30/16
CSA-1	36	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**
	70	54.9	58.0	55.9	55.8	55.6	53.0	53.6	51.0	49.3	49.1	57.3
	125	50.9	54.8	53.7	54.3	55.2	53.7	69.4	68.0	67.3	66.9	68.4
CSA-2	77	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**
	97	79.7	80.6	80.8	81.3	81.2	81.1	80.6	80.8	80.5	81.2	81.4
	127	59.0	61.8	61.9	63.7	63.5	63.6	66.0	69.2	68.7	70.1	70.5
CSA-3	77	70.0	68.8	68.9	69.1	68.8	68.9	68.9	75.8	75.9	75.9	76.3
	97	71.7	73.4	73.6	74.6	74.5	74.0	74.4	67.7	66.9	67.9	68.1
	127	68.4	69.4	69.2	69.7	69.2	68.6	69.0	61.4	60.8	62.4	63.1
CSA-4	44	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**
	60	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**	Dry**
	125	70.6	71.4	68.4	68.3	68.9	61.3	63.1	72.2	72.8	72.6	71.3

**Note: No positive water pressure measured by VW piezometer.